DIABETES AND DISABILITY

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Acknowledgements

Å Thank you to SC DHEC for inclusion of disability
Å Thank you to the people and families I serve ï my teachers
Å Thank you to the Department of PMR, SUNY Upstate

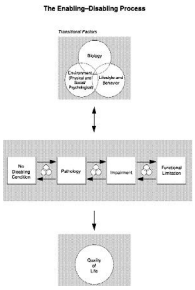
Learning Objective: to identify the interaction of impairments and disabilities with DM and CV risk factors.

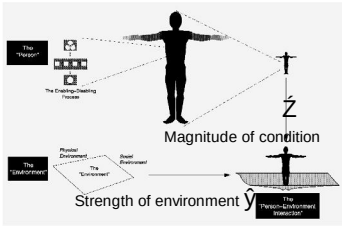
Themes

Å Disability concepts
Å DM risk for disability ï disability risk for DM
Å SCI specifics
Å Interventions for PWD with risk for DM

Conceptualizations

Disability ï Chronic disease

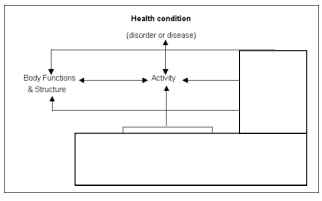




Disability = Interaction between person and environment

Conceptualization

Disability ï Chronic disease

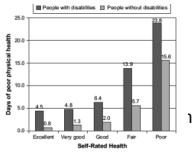


Message for clinicians:
Access to care
Alternative formats
Follow through

WHO ICF
(International Classification of Functioning, Disability and Health)

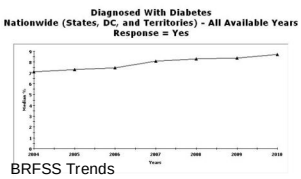
Concept: Health Perception

Å People with disabilities different views re: health, satisfaction, QOL
Albrecht & Devlieger 1999; CE 2009; Palsbo SE 2011

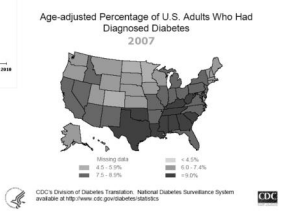


Å Self perception NO disability; often report good health; related to pain/change, not level of function JahnsenR etal, 2004 ó03; SandstromK etal, 2004; TurkMA etal, 1997; NHIS 1994-95
Å Message: typical interactions/communication may not resonate

DM (Pathology) Epidemiology

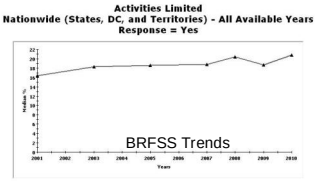


BRFSS Trends



Disability (Activity) Epidemiology

- US Data collection by limitation in mobility, daily, work activity; cause and nature of disability unknown
- US estimate ï 50-60 Million (World:1B)



BRFSS Trends

Disability: Cause or Effect?

DM risk for disability

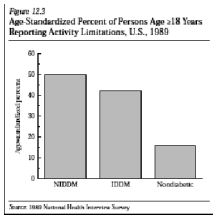
- Vision/hearing impaired
- Motor disability ï obesity, neuropathy, stroke, chronic sores, amputation, cardio-pulmonary
- Pain ï neuropathic, joint
- Co-morbidities (PVD, CVD/CHD, renal)

Disability risk for DM*

- Low physical activity
- Obesity/overweight
- SCI
- Mental Health
- Vision/Hearing impairment

* National Council on Disability, 2009

DM → Disability Activity Limitation



Diabetes in America, Chapter 12 - Songer 1995

1989 NHIS ï additional DM module

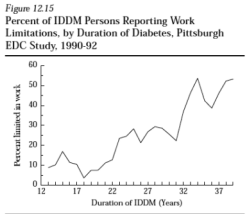
Table 12.17
Percent of Persons Reporting Restrictions in Normal Activities, by Type of Activity and Age, U.S., 1989

Activity and age (years)	NIDDM	IDDM	Nondiabetic population
Personal care needs (e.g., bathing, eating, dressing)			
18-44	3.9	8.4	1.8
45-69	5.0	10.3	2.5
Other routine needs (e.g., household chores, shopping, etc)			
18-44	14.1	12.5	7.1
45-69	14.1	15.7	6.3

Source: 1989 National Health Interview Survey

IDDM = Type 1; NIDDM = Type 2

DM → Disability Participation, Health Care



Diabetes in America, Songer 1995

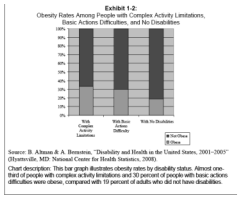
Table 12.15
Health Care Use by Disability Status, Age ≥18 Years, U.S., 1989

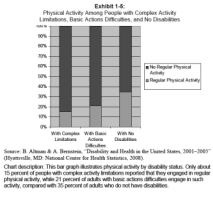
	Diabetic population		Nondiabetic population	
	Limited	Not limited	Limited	Not limited
Physician visits				
Physician contact in the past year (%)	95.7	93.2	89.0	72.0
Hospitalizations				
Hospitalized in the past year (%)	32.4	13.2	22.0	7.3
Average length of stay per discharge (days)	14.2	8.7	11.3	5.3

Source: 1989 National Health Interview Survey

Limited = Disability; Not limited = No acknowledged disability

Disability → Risk for DM National Data





- Education ï lack of accommodation and alternative formats

National Council on Disability, 2009

Disability → Risk for DM
South Carolina

Table 6: Body Mass Index

BMI	DISABILITY			NO DISABILITY		
	n	%	95% CI	n	%	95% CI
< 25	731	26.4	22.8 - 30.1	2048	34.7	32.4 - 36.9
25-29.9	924	32.1	28.6 - 35.6	2292	36.7	34.5 - 38.8
>=30	1227	41.5	37.6 - 45.3	1735	28.7	26.5 - 30.9

P-value <.0001

Table 7: Physical Activity

EXERCISE LAST 30 DAYS	DISABILITY			NO DISABILITY		
	n	%	95% CI	n	%	95% CI
YES	1644	56.8	53.0 - 60.6	4792	77.5	75.7 - 79.3
NO	1366	43.2	39.4 - 47.0	1518	22.5	20.7 - 24.3

P-value <.0001

SC PWD more likely to have unhealthy weight and lack activity

BRFSS South Carolina, Mann et al 2010

Disability → DM
South Carolina

Table 15: Ever Diagnosed with Diabetes

EVER TOLD BY DOCTOR YOU HAVE DIABETES	DISABILITY			NO DISABILITY		
	n	%	95% CI	n	%	95% CI
YES	790	20.4	17.9 - 22.9	748	7.2	6.3 - 8.2
NO	2240	79.6	77.1 - 82.1	5566	92.8	91.8 - 93.7

P-value <.0001

- PWD more common insulin use, glucose self-monitoring, health care visits, retinopathy
- PWD more commonly tested for DM

BRFSS South Carolina, Mann et al 2010

Disability conditions at risk for DM

NHIS 2000-06 data: under age 65yrs, 2-3X DM report mobility limited adults vs. non-mobility adults Jones 2009

- Mental health
- Vision/hearing impairment (circular?)
- ID/DD
- SCI/SCD

Cognitive Disability

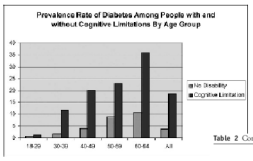


Figure 1 Prevalence rate of diabetes.

- MEPS data
- Higher prevalence 19 v 4%
- More co-morbidities

Reichard 2011

Table 2 Comorbidity by Diabetes Group, Disability Status, and Chronic Health Condition

	Diabetes				No diabetes			
	No disability group		Cognitive limitations group		No disability group		Cognitive limitations group	
Chronic condition*	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Asthma	6.3	4.5–8.9	34.9	27.7–42.8	7.8	7.2–8.4	20.1	17.0–23.6
Arthritis	19.1	16.0–22.8	60.4	53.2–67.2	8.3	7.8–8.9	37.7	33.7–41.9
Cardiac disease	11.5	8.8–14.9	37.6	30.7–45.0	3.6	3.2–4.1	12.7	10.2–15.6
High cholesterol	52.2	48.2–56.2	70.1	63.3–76.1	14.4	13.6–15.1	29.4	26.1–32.9
High blood pressure	51.1	46.6–55.6	81.8	75.2–86.9	13.8	13.1–14.6	34.3	30.6–38.3
Stroke	1.8	1.2–2.9	14.2	9.4–20.9	0.4	.3–.6	7.3	5.6–9.6

Note. All point estimates are weighted. These variables define someone with a cognitive limitation as anyone who "(1) experience[s] confusion or memory loss, (2) [has] problems making decisions, or (3) require[s] supervision for their own safety" (Medical Expenditures Panel Survey, 2006).
*Significant group differences, $p < .0001$, comparing disability group to the no disability group.

Obesity controlled: No difference w/wo ID in SC practice

McDermott et al 2006, 2007

Spinal Cord Injury: Metabolic Syndrome

- Relative overweight/obesity
- Associated carbohydrate and lipid abnormalities ï 4 fold ŷ risk DM
- Immediate and ongoing loss muscle mass and gain adiposity (sarcopenia): immobility, Ź anabolic forces, ŷ catabolic

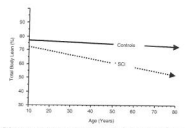


FIGURE M-3 Association between the percentage of total percent lean tissue in the body and age for able-bodied controls (solid curves; slope = -0.182; $r^2 = 0.32$) compared with that for individuals with spinal cord injuries (SCI; dashed curves; slope = -0.273; $r^2 = 0.10$; $\uparrow$, $p < 0.0001$).
SOURCE: Compiled from data presented by Spungen et al. (2003).

Baumann, 2006

Spinal Cord Injury: Metabolic Syndrome

- BMI in SCI ï underestimates true adiposity
- Higher and more complete the lesion, greater lean mass loss
- Tetra/complete SCI: 73% abnl glucose

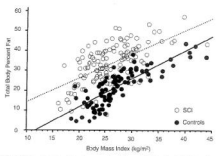


FIGURE M-4 Relationship of percent body fat to BMI for individuals with spinal cord injuries (SCI) compared with that for controls.
SOURCE: Spungen et al., (2003). Used with permission.

Baumann, 2006

Spinal Cord Injury: Metabolic Syndrome

- Premature development CVD
- Low HDL
- Increased DM risk, higher/complete
- Increased hypertension in Paraplegia
- Abnormal platelet function → impaired platelet aggregation inhibition

Kahn, Baumann, Sinha, Kahn 2011

Preventive Management DM

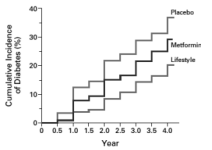
- ADA Standards Medical Care in DM 2012
  - Detection and diagnosis
  - Delay or prevent Type 2
  - Medical care – glycemic control/monitoring, pharmacology options
  - Nutrition, PA, Self-management, Psychosocial
  - Prevention complications
  - Special populations – no mention disability

Diabetes Care, 35:Suppl 1; 1/2012

Preventive Management DM

- Quality markers and improvement strategies – improved HgbA1C; barriers depression, substance Shojnia et al 2006*; Grant 2003*
- Self-management (DSME) – improved <6 mos, modest >6mos Norris et al Diabetes Care 2001*
- Lifestyle changes – improved outcomes Knowler et al NEJM 2002*

*** No disability comments**



DM Preventive Management: Disability

- Quality indicator screening:
  - SC faired well: BRFSS 2010 PWD vs NoDis
  - Kansas: Mobility impairment – High screen Reichard 2012
    ID/DD – Low screen Shireman 2010
- Education:
  - No clear data; descriptive, focus groups
  - Alternative formats – Position paper, Williams, A, *The Diabetes Educator* 28:6(2002)

DM Preventive Management: Disability and Exercise

- ↓ pain (SCI,ID); ↓ fatigue (MS, MD); ↓ depression (MH, SCI, MS, Stroke, ID); ↓ weight (stroke, ID, MH); ↑ sleep (SCI) Chen, Rimmer 2009
- ↑ strength, endurance (CP, ID, MD, MS, SCI/D, MH, Stroke)
- Adherence ∝ health concerns (fatigue, pain), limited social support, negative beliefs, accessibility Turk 1997; Drum et al 2009; Gray-Stanley 2009

DM Preventive Management: Disability and Health Promotion

- Theories of motivation, behavior change; personalized contacts, personalized programs; accessibility and alternative formats Drum, Krahn, Bersani 2009
- Disease management (e.g. DSME) vs. Wellness/HP
- Immediate post-intervention positive impact, wide range of chronic disabling conditions Stuifbergen 2010

SUMMARY

- Disability concepts include medical issues, function and participation, and health perception differences
- Disability with diabetes can confound typical preventive management
- ADA Standards – inclusion PWD?

SUMMARY

- Consider accessibility (e.g. formats, cognitive levels, environment) and perceived barriers – useful many populations
- Science supports exercise and health promotion (self-management) for PWD – no specific context for DM

CHALLENGE

SC DHEC: Consider technical support for modification to DM Preventive Management standards and tools

Clinicians: Consider modification to practice routines to offer accessible and disability-sensitive care